Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Exemption (b)(5) - Attorney-Client Privilege, Attorney Work Product, Deliberative Process Privilege

[redacted]

Inspection Under the National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities 40 CFR 61, Subpart H

I. FACILITY IDENTIFICATION

A. Facility Location

Portsmouth Gaseous Diffusion Plant
United States Department of Energy Portsmouth Site Office
Post Office Box 700
Piketon, Ohio 45661

B. Responsible Official

Eugene W. Gillespie, Site Manager (USDOE)
Phone: (614) 897-5010

T. Michael Taimi, Environmental Assurance and Policies Manager (USEC)
Phone: (301) 564-3409

II. DATE OF INSPECTION

August 17-18, 1995

III. PARTICIPANTS

A. Facility

Melda Rafferty, USDOE/PORTS; Robert Blythe, LMUS; Tony Saraceno, LMUS; Larry Zonner, LMUS; Clyde Dulin, LMUS; Mary Young, USEC; W. E. Landrum, LMUS; T. L. Olin, LMES; Kenneth Tomko, LMUS; Jason Patrick, LMUS; Carol Van Meter, LMUS.

B. USEPA

Michael H. Murphy, USEPA Region 5

IV. ACRONYMS AND ABBREVIATIONS USED IN THIS REPORT

ANSI American National Standards Institute

APC	Air Pollution Control
BE	Building exhaust
CFR	Code of Federal Regulations
cpm	Counts per minute
DAPC	Dayton Air Pollution Control
DMR	Discharge Monitoring Report
DQO	Data Quality Objective
EML	Environmental Measurements Laboratory
EMSL-LV	Environmental Monitoring Systems Laboratory at Las Vegas
FFCA	Federal Facility Compliance Agreement
g	Grams
Ge(Li)	Germanium Lithium detection probe
HASA	High Assay Sampling Area
KeV	Kilo electron volts (1000 electron volts)
LMES	Lockheed Martin Energy Systems (formerly MMES)
LMUS	Lockheed Martin Utility Services (formerly MMUS)
μm	Micrometer, Micron (0.000001 meter)
MDL	Minimum detection Limit
MMES	Martin Marietta Energy Systems
MMUS	Martin Marietta Utility Systems
N/A	Not Applicable or Not Available
NAREL	National Air and Radiation Environmental Laboratory
NESHAP	National Emission Standard for Hazardous Air Pollutants
NOAA	National Oceanographic and Atmospheric Administration

PAT	Proficiency Analysis Testing Program
PET	Proficiency Environmental Testing Program
PORTS	Portsmouth Gaseous Diffusion Plant
QA	Quality Assurance
QAPjP	Quality Assurance Project Plan
QC	Quality Control
SC&A	Sanford Cohen and Associates
USDOE	United States Department of Energy
USEC	United States Enrichment Corporation
USEPA	United States Environmental Protection Agency
WP	Water Pollution Performance Evaluation Study

V. OBJECTIVE/SCOPE OF INSPECTION

The objective of this inspection is to provide a follow-up to the baseline evaluation by the USEPA for compliance with the radionuclide NESHAP, 40 CFR 61, Subpart H of March 16-19, 1993. The inspection is intended to ascertain whether the Portsmouth Gaseous Diffusion Plant is meeting the Findings of the previous Inspection on the agreed schedule. The Findings of this Inspection will determine the necessity of negotiating a Federal Facility Compliance Agreement (FFCA).

The scope of the inspection is to 1) perform a limited walk-through survey to observe all of the locations that are or are currently suspected of being emission points on site to determine compliance with the monitoring requirements of the regulation, and 2) examine documents on dose modelling and compliance with other recordkeeping requirements.

VI. FACILITY DESCRIPTION

The Portsmouth Gaseous Diffusion Plant site is owned by the USDOE. Effective July 1, 1993, USDOE leased the production facilities to the United States Enrichment Corporation (USEC), which was established by the National Energy Policy Act of 1992. Lockheed Martin Utility Services (LMUS), formerly Martin Marietta Utility Services (MMUS), operates the leased facilities for USEC. Lockheed Martin Energy Systems (MMES), formerly Martin Marietta Energy Systems (MMES), remains the management and operating contractor for USDOE responsibilities at the site, which are mainly environmental restoration, waste management, and non-production enrichment facilities management. USDOE is also responsible for the decontamination activities in the X-326 Building, X-326 "L-Cage" and its glovebox, X-345 high assay sampling area (HASA), and the X-774G glovebox. The preceeding clarification was paraphrased from a provided comment from the PORTS USDOE Site Manager, Eugene W. Gillespie, dated November 13, 1995.

This facility description is taken from the United States Department of Energy (USDOE) 1991 Air Emissions Annual Report submitted pursuant to 40 CFR 61.94, in Subpart H.

The Portsmouth Gaseous Diffusion Plant (PORTS) is owned by the Department of Energy and is managed by Martin Marietta Energy Systems, Inc. (MMES). The facility is located in a sparsely populated rural Pike County, Ohio, on a 16.2 km2 (6.3 mile2) site about 1.6 km (1 mile) east of the Scioto River Valley at an elevation approximately 36.6 m (120 ft) above the Scioto River floodplain. The terrain surrounding the plant, except for the Scioto River floodplain, consists of marginal farmland and densely forested hills. The Scioto River floodplain is farmed extensively, particularly with grain crops.

Pike County has a generally moderate climate. Winters in Pike County are moderately cold and summers are moderately warm and humid. The precipitation is usually well distributed with fall being the driest season. Prevailing winds at the site are out of the southwest to south. Average wind speeds are about 5 mph (8 km/h), although winds of up to 75 mph (120 km/h) have been recorded at the plant site. Usually, high winds at the site are associated with thunderstorms that occur in the spring and summer. Southern Ohio is within the midwestern tornado belt although no tornados have struck the plant *site to date.*

Pike County has approximately 23,000 residents. Scattered rural development is typical; however, the county contains numerous small villages such as Piketon, Wakefield, and Jasper, which lie within a few kilometers of the plant. The county's largest community, Waverly, is about 19 km (12 miles) north of the plant site and has a population of approximately 5100 residents. Additional population centers within 80 km (50 miles) of the plant are Portsmouth (population 25,500), Chillicothe (population 23,420), and Jackson (population 6675). The total population of the area lying within an 80 km (50 mile) radius of the plant is approximately 600,000.

The principal site process is the separation of uranium isotopes through gaseous diffusion. Support operations include the feed and withdrawal of material from the primary process, treatment of water for both potable and cooling purposes, steam generation for heating purposes, decontamination of equipment removed from the process for maintenance or replacement, recovery of uranium from various waste materials, and treatment of industrial wastes generated onsite.

VII. INSPECTION FINDINGS

GENERAL FINDINGS

Findings from the USEPA inspection reports of 1993 and 1994 were reviewed. Due to the high degree of cooperation between all involved parties, corrections aimed at radionuclide NESHAP compliance have run ahead of the proposed schedule. All findings from the initial inspection report have currently been addressed. Due to the satisfactory resolution of these initial findings, there is no need to negotiate a FFCA at this time. The Specific Finding below restate the original finding from the 1993 USEPA inspection report and note the date the finding was resolved.

SPECIFIC FINDINGS

<u>**Stack-Sampling Line Losses**</u>

Inspection Finding
March 16-19, 1993

Though sampling lines are kept to short lengths, generally one meter or less, the number of bends in these lines have not been kept to a minimum as is cited in ANSI N13.1.

Losses due to sampling-line deposition must be considered in computing annual stack releases. Losses on sampling lines may occur due to gravitational deposition, brownian diffusion, and turbulent-flow deposition. The fraction of particulates in the effluent stream that deposits by these processes will depend upon such parameters as flow velocity, particle size, particle density, length of sampling line, etc. In addition, losses will occur at bends in the sampling line. ANSI N13.1 recommends making sampling lines as short and with the fewest bends as possible.

The amount of material that deposits in sampling lines can be estimated by solving appropriate equations (AN91, ANSI69), or they may be determined by removing the sampling line, rinsing the deposited material from the line with an acid solution, and analyzing the solution for the appropriate constituents. The quantities determined by either method should be added to the annual discharge from the stack. The latter method is used at PORTS for determining sampling line losses, which is much more accurate than the computational method.

The sampling lines on the PORTS stack samplers are, in general, short (1 meter or less) and include 2 or 3 bends, which in some cases seem unnecessary. A bend of 180 is extreme and probably should be avoided if at all possible. It should be pointed out, however, that the 180 bends are formed in wide arcs which probably minimizes the losses in those bends.

Completion Date: **All noted Findings in this sections completed by June 16, 1995.**

<u>Isokinetic Stack Sampling</u>

Inspection Finding
March 16-19, 1995

The sampling being conducted in the airborne effluent stream is very close to the isokenetic sampling requirement for particulates with correction factors in the range of 1.06 to 0.96.

Non-representative sampling (anisokinetic sampling) results from the failure to withdraw a sample from a flowing stream at the same velocity that exists locally in the stream. If sampling occurs at a much lower velocity, larger particles will be impacted into the collecting probe, whereas at much higher sampling rates, a greater fraction of smaller particles will be drawn into the probe.

The Portsmouth Gaseous Diffusion Plant Quality Assurance Project Plan-Draft (POEF-3578, June 1992) (QAPjP) defines a measure of isokinetic sampling as follows:

where

%Iso = percent of sample probe nozzle gas velocity compared to the effluent stack gas velocity;

Avg. Nozzle Velocity = Average gas velocity in sample probe nozzle;

Avg. Gas Velocity = Average velocity of the effluent stack gas.

During the inspection of the continuous vent stack samplers in Building X-336, Mr. Larry Zonner indicated that stack-sampler flow rates are generally maintained between 80 to 90 percent of maximum, and isokinetic sampling occurs at 85 percent of maximum. During this inspection, stack sampler flows for samplers 5, 6 and 7 ranged from 87 to 91 percent of maximum, which is quite close to what is considered isokinetic sampling. Corrections for anisokinetic sampling are relatively small. For example, ANSI reports that the corrections for 4 μm particles when the sampling velocities are 0.5 and 1.5 times the stream velocities are only 1.06 and 0.96, respectively (ANSI69). Thus, it would appear that the PORTS samplers are operated sufficiently near to isokinetic conditions that no corrections are required.

An91 N.K. Anand and A.R. McFarland, "Deposition: Software to Calculate Particle Penetration Through Aerosol Transport Line - Draft Report," Department of Mechanical Engineering, Texas A&M University, Prepared for the U.S. Nuclear Regulatory Commission, NUREG/GR-0006, 1991.

ANSI69 American National Standards Institute, "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities," ANSI N13.1, 1969.

Completion Date: **All findings in this section completed by July 26, 1994.**

Radiochemistry Procedures

Inspection Finding
March 16-19, 1995

The radiochemistry procedures are closely monitored and any procedural changes are documented in a controlled manner.

Billy Short, Tony Saraceno, and Debbie Perez (building X-710) were interviewed briefly concerning the radiochemical procedures for uranium-238, uranium-235, and technetium-99. These procedures are described in:

1) "Analysis Of Alumina Traps From Continuous Vent Monitor For U, U-235, and Tc",TSD-553-359, Rev. 1, January 1, 1987; last record of change, May 21, 1992.

2) "Operating Instructions for Fluorophotometer Q5198A", TSD-551-106-1, August 6, 1990; Revised date, February 15, 1991.

In general, uranium-238 is determined by fluorometry, uranium-235 is determined by measuring the 185.7 KeV photo peak using a Ge(Li) detector, and technetium-99 is measured by liquid scintillation counting following purification by solvent extraction.

From this short interview and with a review of the written procedures, it appeared that the procedures being used are adequate and are being closely followed by the chemists conducting the analyses. Procedural changes are controlled and the process for affecting a change is closely monitored and documented.

Completion Date: **All findings in this section were completed by January 28, 1994.**

<u>Quality Assurance for X-710</u>

Inspection Finding
March 16-19, 1993

The Quality Assurance program appears to meet the necessary objectives of the rule, within the constraints of the inspection.

Time constraints permitted the review of only a few elements of the X-710 Laboratory's Quality Assurance/Quality Control (QA/QC) program. These elements were reviewed with Ms. Carol Van Meter and included the laboratories cross-check analyses program, qualifications of analytical personnel, data quality objectives (DQOs), and nonconformance/corrective action reporting and follow-up.
During the follow up inspection, it was evident that considerable work had been completed to better document all data that was generated. This includes a superior documentation on any data corrections that are made and the justifications for them.

During 1992, PORTS participated in 6 external cross-check analyses programs, which is a more extensive program than at most analytical laboratories. The programs were the Proficiency Environmental Testing Program (PET), Environmental Monitoring Systems Laboratory at Las Vegas (EMSL-LV), Environmental Measurements Laboratory (EML), Discharge Monitoring Report Quality Assurance Study (DMR-QA), Proficiency Analytical Testing Program (PAT), and the Water Pollution Performance Evaluation Study (WP).

Completion Date: **All findings in this section were completed by July 26, 1994.**

<u>Meteorological Monitoring System</u>

Inspection Finding
March 16-19, 1993

In the past, the meteorological monitoring system has been out of calibration for a significant amount of time, making all of the data calculated with the noncalibrated data suspect and unable to necessarily establish the compliance status of the facility.

Currently, the meteorological monitoring system has been upgraded to more than meet the requirements of the models used in the CAP-88 PC program. There are three sets of instruments for each of two measuring heights, 10 meters and 40 meters. The 40 meter data is used for the CAP-88 PC program runs. The new instrumentation is tied into the meteorological computers via communication link and has a data logging capability for at least one full week for all data. This data can be "dumped" into a portable computer upon command, so that there should be virtually 100 percent data capture.

The new meteorological tower was erected and the instrument packages were available on site, three sets for each of three measurement locations, but not placed yet due to contractor difficulties. The new tower will gather data at 10 meters, 40 meters, and 60 meters. The instrumentation is virtually identical to the current instrumentation being used for the necessary meteorological data.

The previous meteorological monitoring system was a single meteorological tower (X-120) located south of XT-801, equipped with instrument packages at the 10- and 40-meter levels. Air temperature, wind speed, and direction are measured at both levels. In addition, there is ground level instrumentation for measuring solar radiation, barometric pressure, and precipitation. There were two complete sets of instruments, the second set serving as a backup to the active set; every 6 months the active set was replaced by the backup set and sent to the vendor for calibration. On July 11, 1990, lightning struck the meteorological tower and burned out all of the instruments; an instrument set had just been removed and packaged for shipment to the vendor when the lightning strike occurred. These packaged instruments were then immediately retrieved and put back into service on the tower. Therefore, the meteorological monitoring system's instruments have not been calibrated since July 11, 1990. Common practice, such as stated in USEPA's <u>On-Site Meteorological Program Guidance for Regulatory Modeling Applications</u>, is that the meteorological system should be calibrated every six months.

In October of 1990, a portable meteorological tower was borrowed from the National Oceanographic and Atmospheric Administration (NOAA), with these instruments being permanently mounted on the PORTS tower adjacent to the PORTS instrumentation in late 1991. The NOAA meteorological data format is not compatible with the existing PORTS data processing system, is not used for compliance monitoring, but is used as a means of verifying data from the PORTS instrument set. Also, a project is currently in place to completely upgrade the present meteorological system with new instruments and add six additional monitoring towers; the additional towers are intended to support activities at the site's Emergency Operations Center. This new meteorological system is expected to provide data necessary for NESHAP, Subpart H Compliance modelling.

Completion Date: **All findings in this section were completed by July 26, 1994.**

VIII. CONCLUSIONS AND RECOMMENDATIONS

At this time the previous outstanding findings have been corrected and no new findings were observed in the areas that were inspected.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5
AIR AND RADIATION DIVISION
AIR TOXICS AND RADIATION BRANCH
RADIATION SECTION
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

Inspection Under the National Emission Standards for
Emissions of Radionuclides Other Than Radon
From Department of Energy Facilities

I. FACILITY IDENTIFICATION

A. Facility Location

Portsmouth Gaseous Diffusion Plant
United States Department of Energy Portsmouth Site Office
Post Office Box 700
Piketon, Ohio 45661

B. Responsible Official

Eugene W. Gillespie, Site Manager
Phone: (614) 897-5010

II. DATE OF INSPECTION

July 11, through July 15, 1994

III. PARTICIPANTS

A. Facility

Melda Rafferty, USDOE/PORTS; Jeri L. Elder, R&R/USDOE; Richard Meehan, USDOE/PORTS; Robert Blythe, MMES; Tony Saraceno, MMES; William Short, MMES; Larry Zonner, MMES; Clyde Dulin, MMES; Mary Kirker, MMES; Mary Beth Hamel, MMES; Michael Eversole, MMES; W. E. Landrum, MMES; T. L. Olin, MMES; Dean Roberts, MMES; Kenneth Tomka, MMES; Bryan Corbin, MMES; Doug Scott, MMES; Jason Patrick, MMES; Carol Van Meter, MMES.

B. USEPA

Michael H. Murphy, Region 5; Larry Jensen, Region 5

IV. ACROMYMS AND ABBREVIATIONS USED IN THIS REPORT

ANSI	American National Standards Institute
APC	Air Pollution Control
BE	Building exhaust
CFR	Code of Federal Regulations
cpm	Counts per minute
DAPC	Daton Air Pollution Control
DMR	Discharge Monitoring Report
DQO	Data Quality Objective
EML	Environmental Measurements Laboratory
EMSL-LV	Environmental Monitoring Systems Laboratory at Las Vegas
g	Grams
Ge(Li)	Germanium Lithium detection probe
HASA	High Assay Sampling Area
KeV	Kilo electron volts (1000 electron volts)
μm	Micrometer, Micron (0.000001 meter)
MDL	Minimum detection Limit
MMES	Martin Marietta Energy Systems
MMUS	Martin Marietta Utility Systems
N/A	Not Applicable or Not Available
NAREL	National Air and Radiation Environmental Laboratory
NESHAP	National Emission Standard for Hazardous Air Pollutants
NOAA	National Oceanographic and Atmospheric

Administration

PAT	Proficiency Analysis Testing Program
PET	Proficiency Environmental Testing Program
PORTS	Portsmouth Gaseous Diffusion Plant
QA	Quality Assurance
QAPjP	Quality Assurance Project Plan
QC	Quality Control
SC&A	Sanford Cohen and Associates
USDOE	United States Department of Energy
USEC	United States Enrichment Corporation
USEPA	United States Environmental Protection Agency
WP	Water Pollution Performance Evaluation Study

V. OBJECTIVE/SCOPE OF INSPECTION

The objective of this inspection is to provide a follow up to the baseline evaluation for the radionuclide NESHAP, 40 CFR 61, Subpart H. The inspection is intended to gather data to ascertain whether the Portsmouth Gaseous Diffusion Plant is meeting the Findings of the previous Inspection on the agreed schedule to come into compliance with all requirements of the regulation, and if not, which areas of the facility are out of compliance. The data gathered will support the USEPA case for development of a Federal Facility Compliance Agreement with USDOE, if necessary, to come into compliance with this regulation in a timely manner.

The scope of the inspection is to 1) perform a limited walk-through survey to observe all of the locations that are or are suspected of being emission points on site to determine compliance with the monitoring requirements of the regulation, and 2) examine documents on dose modelling and other recordkeeping requirements of the regulation to determine compliance.

VI. FACILITY DESCRIPTION

This facility description is taken from the United States Department of Energy (USDOE) Air Emissions Annual Report submitted to meet the requirements of 40 CFR 61.94, in Subpart H, for the Calendar Year 1991.

The Portsmouth Gaseous Diffusion Plant (PORTS) is owned by the Department of Energy and is managed by Martin Marietta Energy Systems, Inc. (MMES). The facility is located in a sparsely populated rural Pike County, Ohio, on a 16.2 km2 (6.3 mile2) site about 1.6 km (1 mile) east of the Scioto River Valley at an elevation approximately 36.6 m (120 ft) above the Scioto River floodplain. The terrain surrounding the plant, except for the Scioto River floodplain, consists of marginal farmland and densely forested hills. The Scioto River floodplain is farmed extensively, particularly with grain crops.

Pike County has a generally moderate climate. Winters in Pike County are moderately cold and summers are moderately warm and humid. The precipitation is usually well distributed with fall being the driest season. Prevailing winds at the site are out of the southwest to south. Average wind speeds are about 5 mph (8 km/h), although winds of up to 75 mph (120 km/h) have been recorded at the plant site. Usually, high winds at the site are associated with thunderstorms that occur in the spring and summer. Southern Ohio is within the midwestern tornado belt although no tornados have struck the plant site to date.

Pike County has approximately 23,000 residents. Scattered rural development is typical; however, the county contains numerous small villages such as Piketon, Wakefield, and Jasper, which lie within a few kilometers of the plant. The county's largest community, Waverly, is about 19 km (12 miles) north of the plant site and has a population of approximately 5100 residents. Additional population centers within 80 km (50 miles) of the plant are Portsmouth (population 25,500), Chillicothe (population 23,420), and Jackson (population 6675). The total population of the area lying within an 80 km (50 mile) radius of the plant is approximately 600,000.

The principal site process is the separation of uranium isotopes through gaseous diffusion. Support operations include the feed and withdrawal of material from the primary process, treatment of water for both potable and cooling purposes, steam generation for heating purposes, decontamination of equipment removed from the process for maintenance or replacement, recovery of uranium from various waste materials, and treatment of industrial wastes generated onsite.

VII. INSPECTION FINDINGS

GENERAL FINDINGS

The main points that are addressed regard the meeting of the Findings of the Baseline Inspection, a more in depth review of the records regarding possible radionuclide emissions, and implementation of the Quality Assurance measures specified by MMES/USDOE-MMUS/USEC in the QA/QC document(s) for this site.

For the sample station locations that were inspected, the sampling point and sample collection traps were located in very close proximity to each other. This greatly reduces the probability of losses of material in the lines. Additionally these lines are acid rinsed annually and the rinsate is analyzed and added to the total sample results for that sample location. However, these short sample lines did have 90 and 180 degree bends that could have been better minimized. It was indicated that these bends were to be reduced in number or eliminated as the sampling collection systems were updated.

It is clear that PORTS has been working toward meeting the requirements of 40 CFR 61, Subpart H, from the submittal of a proposed Compliance Plan received by Region 5 on September 3, 1992. Many of the potential areas of concern have been addressed prior to this inspection. Additionally, The proposed schedule for meeting the Inspection Findings from the 1993 Inspection is currently being met or is slightly ahead of schedule.

There is a concern regarding the apparent lack of "backup" personnel to perform specific tasks if the principal personnel are not available. This particular point is being addressed by more personnel being cross-trained in some areas. This will help provide a team depth, but additional staffing may still be necessary to adequately meet this need.

SPECIFIC FINDINGS

Stack-Sampling Line Losses

Though sampling lines are kept to short lengths, generally one meter or less, the number of bends in these lines have not been kept to a minimum as is cited in ANSI N13.1.

Losses due to sampling-line deposition must be considered in computing annual stack releases. Losses on sampling lines may occur due to gravitational deposition, brownian diffusion, and turbulent-flow deposition. The fraction of particulates in the effluent stream that deposits by these processes will depend upon such parameters as flow velocity, particle size, particle density, length of sampling line, etc. In addition, losses will occur at bends in the sampling line. ANSI N13.1 recommends making sampling lines as short and with the fewest bends as possible.

The amount of material that deposits in sampling lines can be estimated by solving appropriate equations (AN91, ANSI69), or they may be determined by removing the sampling line, rinsing the deposited material from the line with an acid solution, and analyzing the solution for the appropriate constituents. The quantities determined by either method should be added to the annual discharge from the stack. The latter method is used at PORTS for determining sampling line losses, which is much more accurate than the computational method.

The sampling lines on the PORTS stack samplers are, in general, short (1 meter or less) and include 2 or 3 bends, which in some cases seem unnecessary. A bend of 180 is extreme and probably should be avoided if at all possible. It should be pointed out, however, that the 180 bends are formed in wide arcs which probably minimizes the losses in those bends.

Isokinetic Stack Sampling

The sampling being conducted in the airborne effluent stream is very close to the isokenetic sampling requirement for particulates with correction factors in the range of 1.06 to 0.96.

Non-representative sampling (anisokinetic sampling) results from the failure to withdraw a sample from a flowing stream at the same velocity that exists locally in the stream. If sampling occurs at a much lower velocity, larger particles will be impacted into the collecting probe, whereas at much higher sampling rates, a greater fraction of smaller particles will be drawn into the probe.

The Portsmouth Gaseous Diffusion Plant Quality Assurance Project Plan-Draft (POEF-3578, June 1992) (QAPjP) defines a measure of isokinetic sampling as follows:

where

%Iso	=	percent of sample probe nozzle gas velocity compared to the effluent stack gas velocity;
Avg. Nozzle Velocity	=	Average gas velocity in sample probe nozzle;
Avg. Gas Velocity	=	Average velocity of the effluent stack gas.

During the inspection of the continuous vent stack samplers in Building X-336, Mr. Larry Zonner indicated that stack-sampler flow rates are generally maintained between 80 to 90 percent of maximum, and isokinetic sampling occurs at 85 percent of maximum. During this inspection, stack sampler flows for samplers 5, 6 and 7 ranged from 87 to 91 percent of maximum, which is quite close to what is considered isokinetic sampling. Corrections for anisokinetic sampling are relatively small. For example, ANSI reports that the corrections for 4 μm particles when the sampling velocities are 0.5 and 1.5 times the stream velocities are only 1.06 and 0.96, respectively (ANSI69). Thus, it would appear that the PORTS samplers are operated sufficiently near to isokinetic conditions that no corrections are required.

An91 N.K. Anand and A.R. McFarland, "Deposition: Software to Calculate Particle Penetration Through Aerosol Transport Line - Draft Report," Department of Mechanical Engineering, Texas A&M University, Prepared for the U.S. Nuclear Regulatory Commission, NUREG/GR-0006, 1991.

ANSI69 American National Standards Institute, "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities," ANSI N13.1, 1969.

Radiochemistry Procedures

The radiochemistry procedures are closely monitored and any procedural changes are documented in a controlled manner.

Billy Short, Tony Saraceno, and Debbie Perez (building X-710) were interviewed briefly concerning the radiochemical procedures for uranium-238, uranium-235, and technetium-99. These procedures are described in:

1) "Analysis Of Alumina Traps From Continuous Vent Monitor For U, U-235, and Tc",TSD-553-359, Rev. 1, January 1, 1987; last record of change, May 21, 1992.

2) "Operating Instructions for Fluorophotometer Q5198A",

TSD-551-106-1, August 6, 1990; Revised date, February 15, 1991.

In general, uranium-238 is determined by fluorometry, uranium-235 is determined by measuring the 185.7 KeV photo peak using a Ge(Li) detector, and technetium-99 is measured by liquid scintillation counting following purification by solvent extraction.

From this short interview and with a review of the written procedures, it appeared that the procedures being used are adequate and are being closely followed by the chemists conducting the analyses. Procedural changes are controlled and the process for affecting a change is closely monitored and documented.

Quality Assurance for X-710

The Quality Assurance program appears to meet the necessary objectives of the rule, within the constraints of the inspection.

Time constraints permitted the review of only a few elements of the X-710 Laboratory's Quality Assurance/Quality Control (QA/QC) program. These elements were reviewed with Ms. Carol Van Meter and included the laboratories cross-check analyses program, qualifications of analytical personnel, data quality objectives (DQOs), and nonconformance/corrective action reporting and follow-up.

During the follow up inspection, it was evident that considerable work had been completed to better document all data that was generated. This includes a superior documentation on any data corrections that are made and the justifications for them.

During 1992, PORTS participated in 6 external cross-check analyses programs, which is a more extensive program than at most analytical laboratories. The programs were the Proficiency Environmental Testing Program (PET), Environmental Monitoring Systems Laboratory at Las Vegas (EMSL-LV), Environmental Measurements Laboratory (EML), Discharge Monitoring Report Quality Assurance Study (DMR-QA), Proficiency Analytical Testing Program (PAT), and the Water Pollution Performance Evaluation Study (WP).

Meteorological Monitoring System

In the past, the meteorological monitoring system has been out of calibration for a significant amount of time, making all of the data calculated with the noncalibrated data suspect and unable to necessarily establish the compliance status of the facility.

Currently, the meteorological monitoring system has been upgraded to more than meet the requirements of the models used in the CAP-88 PC program. There are three sets of instruments for each of two measuring heights, 10 meters and 40 meters. The 40 meter data is used for the CAP-88 PC program runs. The new instrumentation is tied into the meteorological computers via communication link and has a data logging capability for at least one full week for all data. This data can be "dumped" into a portable computer upon command, so that there should be virtually 100 percent data capture.

The new meteorological tower was erected and the instrument packages were available on site, three sets for each of three measurement locations, but not placed yet due to contractor difficulties. The new tower will gather data at 10 meters, 40 meters, and 60 meters. The instrumentation is virtually identical to the current instrumentation being used for the necessary meteorological data.

The previous meteorological monitoring system was a single meteorological tower (X-120) located south of XT-801, equipped with instrument packages at the 10- and 40-meter levels. Air temperature, wind speed, and direction are measured at both levels. In addition, there is ground level instrumentation for measuring solar radiation, barometric pressure, and precipitation. There were two complete sets of instruments, the second set serving as a backup to the active set; every 6 months the active set was replaced by the backup set and sent to the vendor for calibration. On July 11, 1990, lightning struck the meteorological tower and burned out all of the instruments; an instrument set had just been removed and packaged for shipment to the vendor when the lightning strike occurred. These packaged instruments were then immediately retrieved and put back into service on the tower. Therefore, the meteorological monitoring system's instruments have not been calibrated since July 11, 1990. Common practice, such as stated in USEPA's On-Site Meteorological Program Guidance for Regulatory Modeling Applications, is that the meteorological system should be calibrated every six months.

In October of 1990, a portable meteorological tower was borrowed from the National Oceanographic and Atmospheric Administration (NOAA), with these instruments being permanently mounted on the PORTS tower adjacent to the PORTS instrumentation in late 1991. The NOAA meteorological data format is not compatible with the existing PORTS data processing system, is not used for compliance monitoring, but is used as a means of verifying data from the PORTS instrument set. Also, a project is currently in place to completely upgrade the present meteorological system with new instruments and add six additional monitoring towers; the additional towers are intended to support activities at the site's Emergency Operations Center. This new meteorological system is expected to provide data necessary for NESHAP, Subpart H Compliance modelling.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5
AIR AND RADIATION DIVISION
AIR TOXICS AND RADIATION BRANCH
RADIATION SECTION
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

Inspection Under the National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities

I. FACILITY IDENTIFICATION

A. Facility Location

Portsmouth Gaseous Diffusion Plant
United States Department of Energy Portsmouth Site Office
Post Office Box 700
Piketon, Ohio 45661

B. Responsible Official

Eugene W. Gillespie, Site Manager
Phone: (614) 897-5010

II. DATE OF INSPECTION

March 16 through March 19, 1993

III. PARTICIPANTS

A. Facility

Gene Gillespie, USDOE/PORTS; Melda Rafferty, USDOE/PORTS; Jeri L. Elder, R&R/USDOE; Richard Meehan, USDOE/PORTS; Gary M. Reffit, MMES; Gregory Gaslow, MMES; Robert Blythe, MMES; Tony Saraceno, MMES; Larry Zonner, MMES; Clyde Dulin, MMES; Mary Kirker, MMES; Mary Beth Hamel, MMES; Michael Eversole, MMES; W. E. Landrum, MMES; T. L. Olin, MMES; Kenneth Tomka, MMES; Bryan Corbin, MMES; Doug Scott, MMES; James Litteral, MMES; Carol Van Meter, MMES.

B. <u>Ohio EPA</u>

Kelly Kaletsky, DAPC; Randall I. Hock, APC.

C. <u>USEPA</u>

Michael H. Murphy, Region 5; Larry Jensen, Region 5, Eugene Jablonowski, Region 5; Robert Hays, Region 5; Craig Conklin, ORIA Headquarters; Richard L. Blanchard, SC&A Contractor-NAREL.

IV. ACROMYMS AND ABBREVIATIONS USED IN THIS REPORT

ANSI	American National Standards Institute
APC	Air Pollution Control
BE	Building exhaust
CFR	Code of Federal Regulations
cpm	Counts per minute
DAPC	Daton Air Pollution Control
DMR	Discharge Monitoring Report
DQO	Data Quality Objective
EML	Environmental Measurements Laboratory
EMSL-LV	Environmental Monitoring Systems Laboratory at Las Vegas
g	Grams
Ge(Li)	Germanium Lithium detection probe
HASA	High Assay Sampling Area
KeV	Kilo electron volts (1000 electron volts)
μm	Micrometer, Micron (0.000001 meter)
MDL	Minimum detection Limit
MMES	Martin Marietta Energy Systems
N/A	Not Applicable or Not Available

NAREL	National Air and Radiation Environmental Laboratory
NESHAP	National Emission Standard for Hazardous Air Pollutants
NOAA	National Oceanographic and Atmospheric Administration
PAT	Proficiency Analysis Testing Program
PET	Proficiency Environmental Testing Program
PORTS	Portsmouth Gaseous Diffusion Plant
QA	Quality Assurance
QAPjP	Quality Assurance Project Plan
QC	Quality Control
SC&A	Sanford Cohen and Associates
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
WP	Water Pollution Performance Evaluation Study

V. OBJECTIVE/SCOPE OF INSPECTION

The objective of this inspection is to provide a baseline evaluation for the radionuclide NESHAP, 40 CFR 61, Subpart H. The inspection is intended to gather data to ascertain whether the Portsmouth Gaseous Diffusion Plant is in compliance with all requirements of the regulation, and if not, which areas of the facility are out of compliance. The data gathered will support the USEPA case for development of a Federal Facility Compliance Agreement with USDOE, if necessary, to come into compliance with this regulation in a timely manner.

The scope of the inspection is to 1) perform a walk-through survey to observe all of the locations that are or are suspected of being emission points on site to determine compliance with the monitoring requirements of the regulation, and 2) examine documents on dose modelling and other recordkeeping requirements of the regulation to determine compliance.

VI. FACILITY DESCRIPTION

This facility description is taken from the United States Department of Energy (USDOE) Air Emissions Annual Report submitted to meet the requirements of 40 CFR 61.94, in Subpart H, for the Calendar Year 1991.

The Portsmouth Gaseous Diffusion Plant (PORTS) is owned by the Department of Energy and is managed by Martin Marietta Energy Systems, Inc. (MMES). The facility is located in a sparsely populated rural Pike County, Ohio, on a 16.2 km2 (6.3 mile2) site about 1.6 km (1 mile) east of the Scioto River Valley at an elevation approximately 36.6 m (120 ft) above the Scioto River floodplain. The terrain surrounding the plant, except for the Scioto River floodplain, consists of marginal farmland and densely forested hills. The Scioto River floodplain is farmed extensively, particularly with grain crops.

Pike County has a generally moderate climate. Winters in Pike County are moderately cold and summers are moderately warm and humid. The precipitation is usually well distributed with fall being the driest season. Prevailing winds at the site are out of the southwest to south. Average wind speeds are about 5 mph (8 km/h), although winds of up to 75 mph (120 km/h) have been recorded at the plant site. Usually, high winds at the site are associated with thunderstorms that occur in the spring and summer. Southern Ohio is within the midwestern tornado belt although no tornados have struck the plant site to date.

Pike County has approximately 23,000 residents. Scattered rural development is typical; however, the county contains numerous small villages such as Piketon, Wakefield, and Jasper, which lie within a few kilometers of the plant. The county's largest community, Waverly, is about 19 km (12 miles) north of the plant site and has a population of approximately 5100 residents. Additional population centers within 80 km (50 miles) of the plant are Portsmouth (population 25,500), Chillicothe (population 23,420), and Jackson (population 6675). The total population of the area lying within an 80 km (50 mile) radius of the plant is approximately 600,000.

The principal site process is the separation of uranium isotopes through gaseous diffusion. Support operations include the feed and withdrawal of material from the primary process, treatment of water for both potable and cooling purposes, steam generation for heating purposes, decontamination of equipment removed from the process for maintenance or replacement, recovery of uranium from various waste materials, and treatment of industrial wastes generated onsite.

In Appendix 1, the entire Annual Report for 40 CFR 61, Subpart H, is included along with the CAP-88 computer modelling run for the calendar year 1991.

VII. INSPECTION FINDINGS

GENERAL FINDINGS

The main points that need to be addressed seem to fall into two general areas; documentation, and the implementation of the Quality Assurance measures specified by MMES/USDOE in the QA/QC document(s) for this site.

For the sample station locations that were inspected, the sampling point and sample collection traps were located in very close proximity to each other. This greatly reduces the probability of losses of material in the lines. Additionally these lines are acid rinsed annually and the rinsate is analyzed and added to the total sample results for that sample location. However, these short sample lines did have 90 and 180 degree bends that could have been better minimized. See the comment in the Stack-Sampling Line Losses for further clarification.

It is clear that PORTS has been working toward meeting the requirements of 40 CFR 61, Subpart H, from the submittal of a proposed Compliance Plan received by Region 5 on September 3, 1992. Many of the potential areas of concern have been addressed prior to this inspection, but additional steps need to be taken to fully meet all requirements of the regulation.

There is a concern regarding the apparent lack of "backup" personnel to perform specific tasks if the principal personnel are not available. From this, it can be assumed that the PORTS personnel lack a team depth. Through personal interviews with , admittedly, few personnel, it seemed that there were only certain individuals that were knowledgeable regarding all aspects of the particular area being investigated. Other personnel that were not present may have equivalent knowledge, though they were not present during the inspection interviews.

SPECIFIC FINDINGS

<u>Stack-Sampling Line Losses</u>

Though sampling lines are kept to short lengths, generally one meter or less, the number of bends in these lines have not been kept to a minimum as is cited in ANSI N13.1.

Losses due to sampling-line deposition must be considered in computing annual stack releases. Losses on sampling lines may occur due to gravitational deposition, brownian diffusion, and turbulent-flow deposition. The fraction of particulates in the effluent stream that deposits by these processes will depend upon such parameters as flow velocity, particle size, particle density, length of sampling line, etc. In addition, losses will occur at bends in the sampling line. ANSI N13.1 recommends making sampling lines as short and with the fewest bends as possible.

The amount of material that deposits in sampling lines can be estimated by solving appropriate equations (AN91, ANSI69), or they may be determined by removing the sampling line, rinsing the deposited material from the line with an acid solution, and analyzing the solution for the appropriate constituents. The quantities determined by either method should be added to the annual discharge from the stack. The latter method is used at PORTS for determining sampling line losses, which is much more accurate than the computational method.

The sampling lines on the PORTS stack samplers are, in general, short (1 meter or less) and include 2 or 3 bends, which in some cases seem unnecessary. A brief description of some of the sampling lines observed is given below.

Sampler	Length of Line	Bends
No. 2	˜ 1 meter	1-180 , 1-90
No. 4	< 1 meter	2-90
No. 14	˜ 1 meter	1-180 , 1-90
No. 15	˜ 1 meter	1-180 , 1-90
No. 16	˜ 1 meter	1-180 , 1-90
No. 5	˜ 1 meter	1-180 , 2-90
No. 6	˜ 1 meter	1-180 , 2-90
No. 7	˜ 1 meter	1-180 , 2-90

A bend of 180 is extreme and probably should be avoided if at all possible. It should be pointed out, however, that the 180 bends are formed in wide arcs which probably minimizes the losses in those bends.

Examples of sampling-line losses for 1991 are given below for three samplers, numbers 5, 6, and 7. These samplers measure the effluents from the three stacks at the end of building X-336, which account for over 80 percent of PORTS discharges.

These data reflect only small sampling losses due to deposition in the sampling lines, which are appropriately accounted for in determining annual stack releases. The reason for the small losses is probably primarily due to the short sampling lines.

Historically, a significant source of the new line losses originated from a side reactor which is now permanently out of service. Discontinuation of the process side stream reactor further minimizes deposition on the SIDE and "E" JET sampling lines below the examples cited in the EPA inspection report. System component material (nickel) is utilized to avoid sampling-line corrosion which is another potential source of line losses.

EXAMPLES OF SAMPLING-LINE LOSSES

Stack Sampler	Total Uranium in Effluent, g	Total Uranium in Lines, g*	Percent Deposited in Sampling Lines
No. 5 (Side)	417.4	19.4	4.7
No.6 (Top)	40.7	0.4	1.0
No. 7 (E-Jet)	217.4	23.1	10.6

*Measured in acid rinse of the lines.

Isokinetic Stack Sampling

The sampling being conducted in the airborne effluent stream is very close to the isokenetic sampling requirement for particulates with correction factors in the range of 1.06 to 0.96.

Non-representative sampling (anisokinetic sampling) results from the failure to withdraw a sample from a flowing stream at the same velocity that exists locally in the stream. If sampling occurs at a much lower velocity, larger particles will be impacted into the collecting probe, whereas at much higher sampling rates, a greater fraction of smaller particles will be drawn into the probe.

The Portsmouth Gaseous Diffusion Plant Quality Assurance Project Plan-Draft (POEF-3578, June 1992) (QAPjP) defines a measure of isokinetic sampling as follows:

where

%Iso	=	percent of sample probe nozzle gas velocity compared to the effluent stack gas velocity;
Avg. Nozzle Velocity	=	Average gas velocity in sample probe nozzle;
Avg. Gas Velocity	=	Average velocity of the effluent stack gas.

During the inspection of the continuous vent stack samplers in Building X-336, Mr. Larry Zonner indicated that stack-sampler flow rates are generally maintained between 80 to 90 percent of maximum, and isokinetic sampling occurs at 85 percent of maximum. During this inspection, stack sampler flows for samplers 5, 6 and 7 ranged from 87 to 91 percent of maximum, which is quite close to what is considered isokinetic sampling. Corrections for anisokinetic sampling are relatively small. For example, ANSI reports that the corrections for 4 μm particles when the sampling velocities are 0.5 and 1.5 times the stream velocities are only 1.06 and 0.96, respectively (ANSI69). Thus, it would appear that the PORTS samplers are operated sufficiently near to isokinetic conditions that no corrections are required.

An91 N.K. Anand and A.R. McFarland, "Deposition: Software to Calculate Particle Penetration Through Aerosol Transport Line - Draft Report," Department of Mechanical Engineering, Texas A&M University, Prepared for the U.S. Nuclear Regulatory Commission, NUREG/GR-0006, 1991.

ANSI69 American National Standards Institute, "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities," ANSI N13.1, 1969.

Continuous Vent Samplers-Calibration of Mass Flowmeters

Calibration procedures for the continuous vent samplers amd mass flowmeters have not been adhered to according to Operational Procedures for the Continuous Vent Stack Samplers (Novenber 1, 1992). In addition, no documented procedure addressing the calibration of the Ambient Air Monitoring Station equipment could be produced. Based on information provided at the time of the inspection the protocols that were currently in force were not adhered to. The changes may have been in process due to system changes and upgrades, but this situation, if initiated, had not been presented, or had been misunderstood.

During the NESHAP inspection, it was observed that the continuous vent samplers numbered 6, 12, 13, 15, and 16, had tags indicating a calibration date of either December 5, 1991, or December 9, 1991. Additionally it was observed that the tags indicated the next due date for calibration was" N/A". According to the Operational Procedures for the Continuous Vent Stack Samplers (November 1, 1992) document, mass flowmeters and insertion mass flowmeters will be calibrated annually; at the time of recalibration, a tag will be attached indicating the date of calibration and the due date of the next calibration. In these particular cases it is evident that these procedures were not adhered to. Based on information provided at the time of the inspection the protocols that were currently in force were not adhered to. The changes may have been in process due to system changes and upgrades, but this situation, if initiated, had not been presented, or had been misunderstood.

Two mass flowmeters, X-333 BE and X-345 HASA, had calibration tags which indicated that they should have been recalibrated on 1/23/93. They were last calibrated on 1/23/92. This does not conform with the requirements of the TSD-523-004, Operational Procedures for the Continuous Vent Stack Samplers. Paragraph 9.2.3 requires flowmeters to be removed and recalibrated annually. These flowmeters should have been removed from service and recalibrated. They need to be recalibrated as soon as possible. At the time of inspection, the protocol in force was used to base the findings upon. USEPA was unaware of any subsequent changes or changes in progress to be taken into consideration regarding this procedure.

Vent Sampler 14, X-326-SE4, had a mass flowmeter which was due for calibration on 12/9/92. The calibration tag had the words "Not Applicable" on it next to the calibration due date. Section 9.0 of TSD-523-004 does not appear to allow this designation. The flowmeter should be removed for calibration as soon as possible.

Note: When the flowmeters are recalibrated, the amount of adjustment needs to be checked against allowable tolerance as established by the QA program. If the instruments are not within the tolerance, then all measurements since the last date of calibration should be considered to be invalid in accordance with paragraph 12.3.1.2 of TSD-523-004.

Section 9.0 of TSD-523-004 requires a tag to be placed on all flowmeters indicating the date of calibration and the due date of the next calibration. Although most of the flowmeters had this tag, it did not contain enough information linking it to the device it was attached to. For example, the tag on the mass flowmeter for sampler #3, Building Cell Exhaust Vent, X-333 BE, had instrument number 800 entered on the tag, however the flowmeter did not have such a number on it; the instrument did have a serial number. It is recommended that the calibration tags also contain the instrument serial numbers so that an easy cross-reference can be made during inspections. The same situation was found on each of the tags inspected. If the units fall into the category specified in the comment (see Finding 8 in Appendix A), the instruments should be marked with the number(s) used for tracking and identification, especially if no serial numbers or other permanent markings are used for tracking and identification.

During observation of the filter change-out at Ambient Monitoring Station A-12, it was noticed that there were not any calibration tags on the equipment. Unfortunately, a procedure which addressed the calibration of this equipment could not be found. Nevertheless, these flowmeters, like others used at the facility, should be calibrated at least every 12 months (annually) and the equipment should be tagged so that when filters are changed or maintenance is performed the tag can be checked.

Radiochemistry Procedures

The radiochemistry procedures are closely monitored and any procedural changes are documented in a controlled manner.

John Sisler, Jim Litteral, and Debbie Perez (building X-710) were interviewed briefly concerning the radiochemical procedures for uranium-238, uranium-235, and technetium-99. These procedures are described in:

1) "Analysis Of Alumina Traps From Continuous Vent Monitor For U, U-235, and Tc",TSD-553-359, Rev. 1, January 1, 1987; last record of change, May 21, 1992.

2) "Operating Instructions for Fluorophotometer Q5198A", TSD-551-106-1, August 6, 1990; Revised date, February 15, 1991.

In general, uranium-238 is determined by fluorometry, uranium-235 is determined by measuring the 185.7 KeV photo peak using a Ge(Li) detector, and technetium-99 is measured by liquid scintillation counting following purification by solvent extraction.

From this short interview and with a review of the written procedures, it appeared that the procedures being used are adequate and are being closely followed by the chemists conducting the analyses. Procedural changes are controlled and the process for affecting a change is closely monitored and documented.

Urinalysis, Environmental Samples, and Air Filter Counting Documentation

A damaged window was used to provide data for approximately four months before the problem was found and corrected. The data processed during that time frame cannot be used to validate compliance. While USDOE/Ports personnel deem this to have caused no impact on the data, USEPA is doubtful that this can be adequately justified. In addition, the documentation needs to better reflect the counting instrument used to count the samples. (See comments for Findings 10, 12, and 13 in Appendix A for more information ann the response to comments).

There appears to be some documentation difficulties relating specifically to 2 Tennelec proportional counters used in the lab to count air filters, environmental samples, and urine samples. One of the counters is dedicated for urinalysis samples, the other for air filters and environmental samples. The latter has been used for urinalysis samples as well.

During the NESHAPs Inspection conducted during the week of March 15 through 19, 1993, several successive entries in the log books in the period June to October 1992, read "high background, planchet changed" (approximate language). These entries were vague and ambiguous. The quality of the sample analysis is the issue. Additionally, it is curious that both counters should develop the same problem at the same time.

According to John Sisler, it was stated that there are daily checks made on each counter using blank and standard samples. These are plotted against a running mean, 2 sigma and 3 sigma from the mean. If trends are noted, then a check is made, corrections taken if required and the mean re-established. In the cases in question, high values were noted several times. The blank planchet was replaced in each case. This did not cure the problem and eventually it was discovered that there were pinholes in the detector windows. The instruments were sent to maintenance where the problem was corrected. Mr.Sissler felt that this problem had no impact on the validity of the samples counted in the period of June to October.

Specific issues involved with this particular problem then arise, and are as follows:

1. The log entries on the 2 Tennelec proportional counters are vague and ambiguous. Little information on any attempts to identify the problem(s) are provided in the logs. In the comments provided by PORTS in Appendix A, this problem has been addressed and USEPA concurrs with the manner that this issue has been addressed.

2. The problem continued in both counters for approximately 4 months.

3. A pinhole in the counter window would give erroneously high counts on the background, standard and samples. The quality of the reported results, in this specific case of air sample data, is likely to be impacted. Refer to Findings 10, 12, and 13 in Appendix A.

Documentation evaluation for Sample 7794-54-6-110

The documentation of the samples needs to be revised to make the tracking of the data back to its source more easily completed. In addition, all forms used should have a title, form number and review sign-off space. All printouts should also have the instrument serial number printed out at the top or bottom of each page.

The documentation for the sample 7794-54-6-110 was followed completely through from alumina preparation to sample analysis. The following points were noted regarding the documentation of this sample.

1. When the analytical results were utilized to determine Technetium-99 (Tc-99), incorrect background numbers were used. The number used was 23 counts per minute (cpm); the correct number should have been 24.49 cpm. Although a lower background results in a higher Tc-99 result, it is not the correct result. There should be some mechanism to check for this type of error. PORTS has addressed this

issue. For resolution see comment on Finding 14 in Appendix A.

2. The calculation sheet for the Tc-99 did not have a form number, the procedure line was left blank, sample weights for blank and standard samples were left blank, and the spike aliquot was left blank. A policy on using "N/A" for blanks which should be filled in should be established. Additionally, this form should have a title, form number and review sign-off space. The QA plan should ensure all forms required by procedure contain these elements. PORTS has addressed this issue. For resolution see comment on Finding 15 in Appendix A.

3. The printout from the Tri-carb liquid scintillation machine does not have any information on it which cross references the printout with the machine. These printouts should have the instrument serial number and lab technician name on them as a minimum. USEPA feels that the printouts should have the instrument serial number or other tracking number part of the printout to better track the samples throughout the sampling document trail.

Quality Assurance for X-710

The Quality Assurance program appears to meet the necessary objectives of the rule, within the constraints of the inspection.

Time constraints permitted the review of only a few elements of the X-710 Laboratory's Quality Assurance/Quality Control (QA/QC) program. These elements were reviewed with Ms. Carol Van Meter and included the laboratories cross-check analyses program, qualifications of analytical personnel, data quality objectives (DQOs), and nonconformance/corrective action reporting and follow-up.

During 1992, PORTS participated in 6 external cross-check analyses programs, which is a more extensive program than at most analytical laboratories. The programs were the Proficiency Environmental Testing Program (PET), Environmental Monitoring Systems Laboratory at Las Vegas (EMSL-LV), Environmental Measurements Laboratory (EML), Discharge Monitoring Report Quality Assurance Study (DMR-QA), Proficiency Analytical Testing

Program (PAT), and the Water Pollution Performance Evaluation Study (WP).

The results of these analyses for 1992 are outlined below.

Program	Total Analyses	Number Acceptable/Marginal*	Percent
PET	1583	1564	99
EMSL-LV	19	18	95
EML	41	41	100
DMR-QA	19	17	89
PAT	128	126	98
WP	97	82	85

*Acceptable = 0.8 to 1.2 and marginal = 0.5-0.8 and 1.2-1.5, where these ratios are equal to PORTS value/known value.

Overall, there were 1,887 cross-check analyses run in 1992 with 98 percent categorized as acceptable or marginal. Similar results were obtained in 1991, 97 percent, and 1990, 99 percent. In future inspections, it would be interesting to determine how many of these analyses were in the acceptable category and how many were in the marginal category.

In general, these results indicate that the analyses performed by the X-710 laboratory have been consistently dependable.

The data quality objective (DQO) for spiked-sample analyses (accuracy) is that if less than 75 percent or greater than 125 percent of the spike is recovered or detected, the spiked-sample analysis is repeated. If the repeat analysis falls below 75 percent or above 125 percent, the entire batch of samples being run with the spiked-analysis are re-analyzed. The DQO for precision is based on the relative percent difference, which should fall between ± 20 percent.

The qualifications of the personnel performing the radiochemical analyses determines, to a large extent, the success of the analytical program. The required qualifications of analytical personnel at PORTS are described in TSD-500-103. The latest update to this document was approved on March 17, 1993.

Because the complexity of analytical operations can vary, the skills required range from basic knowledge of laboratory work to specialized formal training. All personnel must be thoroughly trained and fully understand all the procedures they are required to use.

The qualification process is based primarily on performance and continued demonstration of proficiency in the required job skills; but formal education, experience, and job knowledge are other considerations in qualifying laboratory personnel. Immediate supervision is responsible for qualifying their personnel, assuring proper training is available to meet the qualification requirements, documentation, and performance evaluation.

For procedures that produce analytical results, satisfactory performance is demonstrated by obtaining a value to within ± 25 percent of the established value on three consecutive known controls and on three samples that are replicates of samples analyzed by a qualified job incumbent. Requalification is required routinely 12 months from the date of qualification or automatically upon entry of three nonconforming lab control standards during a current qualification period. Personnel qualification folders are maintained for each lab analyst.

The procedures described briefly above and documented in TSD-500-103 for qualifying analytical personnel are good practices and should meet the required objectives of the QA/QC program. One suggestion is to add to the required proficiency of ± 25 percent for analytical analyses a minimum concentration (e.g., 5 times the MDL), because it will not be possible to satisfy the proficiency test if the concentrations of the known controls or replicate samples are near the MDL.

When a nonconformance incident is observed and corrective action required, the following actions and reporting are required. Signatures and dates are required for each item.

1. A description of the incident and any immediate corrective action taken are documented; including nature of the nonconformance, immediate corrective actions (if any), steps taken to investigate the nonconformance, and an

explanation of the probable cause.

2. A review of the QA requirements is performed, and any required actions documented with a due date.

3. A corrective action plan must be submitted by the concerned department head which will prevent a recurrence of the nonconformance.

4. Documentation that the corrective action plan has been completed. Each corrective action must be noted along with a completion date.

5. The implementation and completion of the corrective action must be verified by the QA Manager.

6. Closure of the nonconformance episode must be verified by the QA Manager.

The tracking and documentation of the corrective action process seems to follow good practice procedures and should meet the goals of the QA program.

Meteorological Monitoring System

The meteorological monitoring system has been out of calibration for a significant amount of time, making all of the data calculated with the noncalibrated data suspect and unable to necessarily establish the compliance status of the facility.

The meteorological monitoring system is an additional area of concern. Data from the meteorological monitoring system is needed to determine compliance through modelling with the USEPA's software. The quality assurance of meteorological data is important when performing Gaussian plume modelling to estimate the dispersion of radionuclides released.

The present meteorological monitoring system is a single meteorological tower (X-120) located south of XT-801, equipped with instrument packages at the 10- and 40-meter levels. Air temperature, wind speed, and direction are measured at both levels. In addition, there is ground level instrumentation for measuring solar radiation, barometric pressure, and precipitation.

There were two complete sets of instruments, the second set serving as a backup to the active set; every 6 months the active set was replaced by the backup set and sent to the vendor for calibration. On July 11, 1990, lightning struck the meteorological tower and burned out all of the instruments; an instrument set had just been removed and packaged for shipment to the vendor when the lightning strike occurred. These packaged instruments were then immediately retrieved and put back into service on the tower. Therefore, the meteorological monitoring system's instruments have not been calibrated since July 11, 1990. Common practice, such as stated in USEPA's On-Site Meteorological Program Guidance for Regulatory Modeling Applications, is that the meteorological system should be calibrated every six months.

In October of 1990, a portable meteorological tower was borrowed from the National Oceanographic and Atmospheric Administration (NOAA), with these instruments being permanently mounted on the PORTS tower adjacent to the PORTS instrumentation in late 1991. The NOAA meteorological data format is not compatible with the existing PORTS data processing system, is not used for compliance monitoring, but is used as a means of verifying data from the PORTS instrument set. Also, a project is currently in place to completely upgrade the present meteorological system with new instruments and add six additional monitoring towers; the additional towers are intended to support activities at the site's Emergency Operations Center. This new meteorological system is expected to provide data necessary for NESHAP, Subpart H Compliance modelling.

Ports has addressed the meteorological monitoring system concerns for future data. See the comments for Findings 17, 18, 19, and 20 in Appendix A.

APPENDIX A
RESPONSE TO COMMENTS
PORTS NESHAPs INSPECTION

Finding (1 & 3):
Page 5

However, these short sample lines did have 90 and 180 degree bends that could have been better minimized. See the comment in the Stack-Sampling Line Losses for further clarification. Though sampling lines are kept to short lengths, generally one meter or less, the number of bends in these lines have not bee kept to a minimum as is cited in ANSI N13.1.

Comment:

There are limited materials that have both the necessary chemical resistance to the uranium process, that provide sufficient health and safety protection to our employees and to the environment with sufficient flexibility (such as plastics) to allow total elimination of bends. Nickel lines, which are fairly rigid, must be employed to maintain chemical resistance against process gasses. Sound engineering design specifies minimal tubing bends to allow adequate line flexibility during trap change-out procedures. A rigid design concept (i.e., no bends) would result in increased possibility of stripped threads on any type of leak tight coupling. In addition, flexural fatigue of the lines during repeated connect-disconnects would be increased and high stresses on the line during operation could more readily cause leak development. The bend radii are greater than ten tubing diameters at each sampling location. The sweeping bend design concept should not interfere with sample collection or stream diversion and, considering that nickel lines are needed for process compatibility, the bends overall are beneficial for the PORTS vent monitoring applications.

Response to Comment:

While it is understood that the materials used have physical constraints as to the structure of the lines for the change-out procedures, it would seem that fewer bends could be engineered to further reduce possibilities of sampling line losses, regardless of their minimal nature and being accounted for in an appropriate manner.

Finding (2):
Page 5

There is a concern regarding the apparent lack of "backup" personnel to perform specific tasks if the principal personnel are not available. From this, it can be assumed that the PORTS personnel lack a team depth.

Comment:

The personnel shortage of concern is managed utilizing a planned work schedule. Routine daily operations are performed with minimum personnel. However, equipment maintenance, calibrations, and trap

change-outs are scheduled with maximum personnel attendance. Some of these operations are performed on overtime. Any emergency situation will be handled by utilizing a preestablished call-in listing of employees. A review of the emergency would be conducted on the next scheduled office shift. Several of the vent sampling units have been in operation since 1985. three of the employees and supervision have been associated with the vent sampling design and operation during this entire time period. With additional units planned for future operations <u>additional personnel</u> and <u>space requirements</u> will be given consideration.

Response to Comment:

Through personal interviews with , admittedly, few personnel it seemed that there were only certain individuals that were knowledgeable regarding all aspects of the particular area being investigated. Other personnel that were not present may have equivalent knowledge, though they were not present during the inspection interviews.

Finding (4):
Page 6

Examples of sampling-line losses for 1991 are given below for three samplers, numbers 5, 6, and 7. These samplers measure the effluents from the three stacks at the end of the building X-326, which account for over 80 percent of PORTS discharges.

These data reflect only small sampling losses due to deposition in the sampling lines, which are appropriately accounted for in determining annual stack releases. The reason for the small losses is primarily due to the short sampling lines.

Comment:

Historically, a significant source of the new line losses originated from a side reactor which is now permanently out of service. Discontinuation of the process side stream reactor further minimizes deposition on the SIDE and "E" JET sampling lines below the examples cited in the EPA inspection report. System component material (nickel) is utilized to avoid sampling-line corrosion which is another potential source of line losses.

Response to Comment:

USEPA concurs with this comment.

Finding (5):
Page 8

Calibration procedures for the continuous vent samplers and mass flowmeters have not been adhered to according to <u>Operational Procedures for the Continuous Vent Stack Samplers</u> (November 1, 1992).

Comment:

Insertion mass flowmeters located at the sampling locations 12, 13, 14, 15, and 16 are have calibration tags stating N/A (Not Applicable). At the time the procedure was issued, this notation for calibration was not in effect. The procedure will be revised at the next scheduled date to include N/A identification at these sampling points. Samplers at locations 12, 13, 14, 15, and 16 are the most recent installations and employ the same type of insertion mass flowmeters (Model AF-88, from Fluid Components, Inc.). Separate procedures TSD-532-063, Calibration Verification of the FCI Insertion Mass Flowmeter, Rev. 0 (Draft), and TSD-532-064, Recalibration of FCI Insertion Mass Flowmeter, Rev. 0 (Draft), have been in preparation to specifically address the aforementioned mass flowmeters. These units were factory calibrated using conditions simulating the flow environment of the vent stacks where the units are used. In addition to the vendor, these flowmeters were also checked at Portsmouth at installation using an engineered flow orifice as a standard to assure readings were reasonably accurate. According to FCI, the manufacturer there is no need to perform a calibration verification or recalibration prior to installation and after the flowmeter is placed in service. Per the vendor, periodic flow calibration is not required but periodic checking of the system's wiring and flow element is necessary. A flowmeter verification procedure is only performed is flowmeter readings appear erroneous according to the vendor. At this time, further interpretation and verification of the operating manual for the AF-88 flowmeter are being obtained from the vendor to clarify the calibration and recalibration instructions for appropriate inclusion in TSD-532-063 and TSD-532-064. In addition, use of an engineered flow orifice as a flow standard is being considered to obtain periodic volumetric verification of the flow readings for the AF-88 insertion mass flowmeter and employ the flow standard whenever flowmeter readings appear erroneous. This activity is expected to be completed by January 31, 1994.

Response to Comment:

Based on information provided at the time of the inspection the protocols that were currently in force were not adhered to. The changes may have been in process due to system changes and upgrades, but this situation, if initiated, had not been presented, or had been misunderstood.

Finding (6):
Page 8

During the NESHAP inspection, it was observed that the continuous vent samplers numbered 6, 12, 13, 15, and 16, had tags indicating a calibration date of either December 5, 1991, or December 9, 1991. Additionally it was observed that the tags indicated that the next due date for calibration was "N/A". According the Operational Procedures for the Continuous Vent Stack Samplers (November 1, 1992) document, mass flowmeters and insertion mass flowmeters will be calibrated annually; at the time of recalibration, a tag will be attached indicating the date of calibration and the due date of the next calibration. In these particular cases it is evident that these procedures were not adhered to.

Comment:

Insertion mass flowmeters located at the sampling locations 12, 13, 14, 15, and 16 have calibration tags stating N/A (Not Applicable). At the time the procedure was issued, this notation for calibration was not in effect. See additional information provided for Finding (5) for clarifying comments concerning vent samplers numbered 12, 13, 15, and 16. sampler location number 6 is calibrated on a regular periodic basis as per TSD-523-004, and further defined in TSD-532-015. This vent sampler has no tag indicating "N/A" for the next due date of calibration. The last calibration date on the tag states 8/19/94. The EPA inspection report may contain a typographical error.

Response to Comment:

See Response to Comment for Finding (5).

Finding (7):
Page 8

Two mass flowmeters, X-333 BE and X-345 HASA, had calibration tags which indicated that they should have been calibrated on 1/23/93. They were last calibrated on 1/23/92. This is a violation of the TSD-523-004, Operational Procedures for the Continuous Vent Stack Samplers. Paragraph 9.2.3 requires flowmeters to be removed and recalibrated annually. These flowmeters should have been removed from service and recalibrated. They need to be recalibrated as soon as possible.

Comment:

The procedure was written with the interpretation of "annual to be once per calendar year. This was confusing since the operation list a one year on the calibration tag as a RED FLAG to remind them that recalibration should be planned, if not already completed. This has been corrected by specifically listing the timeframe (performed once per calendar year - not to exceed 18 months). A procedure TSD-532-015 Calibration Schedule for Flow Measurement Devices of the Continuous Vent Stack Samplers (issued May 15, 1993), specifically addresses this area. The tag date has also been changed to reflect the calibration procedure used. A listing of sampler units is kept with calibration procedures that tracks specific unit activity. Units at X-333 BE (704/704) and X-345 HASA (784/784) were calibrated on 3/30/93 and installed on 3/31/93. Control charts are generated for all flowmeter units and reflect excellent repeatability since installation.

Response to Comments:

At the time of inspection, the protocol in force was used to base the findings upon. USEPA was unaware of any subsequent changes or changes in progress to be taken into consideration regarding this procedure.

Finding (8):
Page 9

Section 9.0 of TSD 523-004 requires a tag to be placed on all flowmeters indicating the date of calibration and the due date of the next calibration. Although most of the flowmeters had this tag, it did not contain enough information linking it to the device it was attached to. For example, the tag on the mass flowmeter for sampler #3, Building Cell Exhaust Vent, X-333 BE, had instrument number 800 entered on the tag, however the flowmeter did not have such a number on it; the instrument did have a serial number.

Comment:

Nine units are presently in use that have four separate components. two are required for a matched set as a traceable calibrated unit. The tag reflects this numbering system. (Example: X-333 BE is 704/704). These two units are the sampling mass flowmeter transducer and flowmeter-totalizer. The other two components in question do have serial numbers and are not listed. These components are the power supply and control valve. These two units are interchangeable at any sampling location and are not a necessary component of a calibrated system. The newer units are dependent on each other to operate, and are therefore calibrated together. The tag on the new units reflect this (Example: X-326 SE4 is 48/274/85).

Response to Comment:

If the units fall into the category specified in the comment, the instruments should be marked with the number(s) used for tracking and identification, especially if no serial numbers or other permanent markings are used for tracking and identification.

Finding (10):
Page 10

A damaged window was used to provide data for approximately four months before the problem was found and corrected. The data processed during that time frame cannot be used to validate compliance. While USDOE/PORTS personnel deem this to have caused no impact on the data, USEPA is doubtful that this can be adequately justified. In addition, the documentation needs to better reflect the counting instrument used to count the samples.

Comment:

The window damage occurred at the time the instruments were taken out of service; the damage did not persist for several months prior to this time while data were being collected and reported. Moreover, the lab did not collect data when the background exceeded acceptance limits; therefore, there is no cause to suspect the quality of reported data. Further clarification of this subject is found in the response to finding (12-13).

Response to Comment:

See Response to comment for Findings (12-13).

Finding (11):
Page 11

The log entries on the 2 Tennelec proportional counters are vague and ambiguous. Little information on any attempts to identify the problem(s) are provided in the logs.

Comment:

A meeting was held with Radiochemistry analysts on 10/01/93 to address log entries. The number of entries are highly variable and development of a check sheet, as suggested, to cover all possibilities would be very difficult. It was concluded that log entries be stated in a more concise legible manner.

Response to Comment:

USEPA concurs with this comment.

Finding (12-13):
Page 11

The problem continued in both counters for approximately 4 months. A pinhole in the counter window would give erroneously high counts on the background, standard and samples. The quality of the reported results, in this specific case of air sample data, is likely to be impacted.

Comment:

This section of the inspection report indicates that two Tennelec proportional counters with damaged windows were used to collect data for several months while the problem was allowed to persist uncorrected. This is a misunderstanding of the actual situation. The window damage occurred at the time the instruments were taken out of service; the damage did not persist for several months prior to this time while data were being collected and reported. Moreover, the lab did not collect data when the background exceeded acceptance limits; therefore, there is no cause to suspect the quality of the reported data. As noted in the inspection report, there were periodic entries in the instrument log books in 1991 and 1992 concerning changing planchets because of high backgrounds. Admittedly, the logbook notations, which alluded to the laboratory practice of taking a recount when the background exceeded

acceptance limits, are not as detailed as they might have been and could well lead to the misconception of a persistent problem going unchecked. Additional detail would have indicated that upon recount, background data were within acceptable limits and, according to the instructions in TSD-553-200, operation could proceed. The practice of taking a recount is based on the fact that at the low background counts dealt with in our laboratory, it is not uncommon for out-of-limits counts to occur. However, with the control program that is in place, any problem that develops will be detected immediately when recounting fails to bring the background within control limits, data are not collected, and the instrument is tagged out of service. Two such incidents, (one on each of the two Tennelec counters then in service), occurred in the time frame discussed, one in late January 1992, and another in mid-March 1992. The point to be stressed is that on the two occasions noted, the failure was immediate and catastrophic, and recount failed to achieve an acceptable background. There was not a long-term situation when the windows were damaged but occasionally functioning acceptably, a fact confirmed by a Tennelec technical representative, as well as by our in-house specialist who serviced the instrument.

Response to Comment:

USEPA appreciates the notification of additional time frames that the Tennelec proportional counters were reading high backgrounds. The period of time that is referenced in the inspection report is June through October of 1992, and not January to mid-March 1992. If this is a common happening, steps need to be taken to minimize the occurrence of such problems.

Finding (14):
Page 11

When the analytical results were utilized to determine Technetium-99 (Tc-99), incorrect background numbers were used. The number used was 23 counts per minute (cpm); the correct number should have been 24.49 cpm. Although a lower background results in a higher Tc-99 result, it is not the correct result. There should be some mechanism to check for this type of error.

Comment:

Use of an incorrect background number did occur in calculating results for the reference sample. Recent improvements in the data review system will eliminate or reduce such errors in the future. The radiochemistry laboratory has instituted peer review by a second analyst qualified to perform the procedure by which the data were collected. The peer review is followed by supervisory review and approval of the data.

Response to Comment:

USEPA concurs with this comment.

Finding (15):
Page 11

The calculation sheet for the Tc-99 did not have a form number, the procedure line was left blank, and the spike aliquot was left blank. A policy on using "N/A" for blanks which should be filled in should be established.

Comment:

All radiochemistry benchsheets that do not presently have such information will be assigned titles, form numbers and review sign-off spaces, (target date:10/31/93). A meeting was held on 10/01/93 with radiochemistry personnel to address the proper manner of filling out forms (i.e., entering all required information and using "N/A" as appropriate, instead of leaving blanks).

Response to Comment:

USEPA concurs with this comment.

Finding (16):
Page 11

The printout from the Tri-carb liquid scintillation machine does not have any information on it which cross references the printout with the machine. These printouts should have the instrument serial number and lab technician name on them as a minimum.

Comment:

Although the printout from the instrument does not bear the instrument serial number, that information is entered on the benchsheet that is included with the instrument printout and other raw data in the data package for each sample batch. All instrument printouts are signed by the responsible analyst (as required by TSD-500-130, "Preparation and Maintenance of Laboratory Records").

Response to Comment:

USEPA feels that the printouts should have the instrument serial number or other tracking number part of the printout to better track the samples throughout the sampling document trail.

Finding (17):
Page 15

The meteorological monitoring system has been out of calibration for a significant amount of time, making all of the data calculated with the noncalibrated data suspect and unable to necessarily establish the compliance status of the facility.

Comment:

The meteorological monitoring system was restored to a fully calibrated state of operation on June 8, 1993. The tower was restored with a full set of calibrated sensors at 10 and 40 meters and at ground level. Each sensor on the tower is backed up by a fully calibrated replacement in the event of a failure at the tower.

Response to Comment:

USEPA concurs with this comment.

Finding (18):
Page 15

The meteorological monitoring system is an additional area of concern. Data from the meteorological monitoring system is needed to determine compliance through modelling with the USEPA's software. The quality assurance of meteorological data is important when performing Gaussian plume modelling to estimate the dispersion of radionuclides released.

Comment:

The meteorological monitoring system has been configured at our site with the USEPA guidelines in mind: EPA-450/4-87-007 "Ambient Monitoring Guidelines for Prevention of Significant Deterioration - PSD", EPA-450/4-87-013 "On-Site Meteorological Program Guidance for Regulatory Modeling Applications", and EPA/600/4-90/003 "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV -- Meteorological Measurements".

Response to Comment:

USEPA concurs with this comment.

Finding (19):
Page 15

The present meteorological monitoring system is a single meteorological tower (X-120) located south of XT-801, equipped with instrument packages at the 10 and 40-meter levels. Air temperature, wind speed, and direction are measured at both levels. In addition, there is ground level instrumentation for measuring solar radiation, barometric pressure and precipitation, There were two complete sets of instruments, the second set serving as a backup to the active set; every 6 months the active set was replaced by the backup set and sent to the vendor for calibration. On July 11, 1990, lightning struck the meteorological tower and burned out all of the instruments; and instrument set had just been removed and packaged for shipment to the vendor when the lightning strike occurred. These packaged instruments were then immediately retrieved and put back into service on the tower. Therefore, the meteorological monitoring system's instruments have not been calibrated since July 11, 1990. Common practice, such as stated in USEPA's On-Site Meteorological Program Guidance for Regulatory Modeling Applications, is that the meteorological systems should be calibrated every six months.

Comment:

A new 60 meter tower is currently being prepared for erection at a location adjacent to the existing tower. Scheduled completion for the south tower is tentatively January, 01, 1994. This tower will have three levels of sensors, i.e., 10, 40, and 60 meters. An assortment of ground level sensors, i.e., barometric pressure, solar radiation, ground temperature, and precipitation will also be provided. Calibration of the system will occur every six months by replacing the existing sensors on the tower with calibrated spare units. The sensors thus removed from the tower will be returned to the vendor for calibration. A third set of sensors is being purchased to have on hand at all times so that if the tower sensors fail while backup units are at the vendor, calibrated sensors will be available to install. Pursuance of a north tower installation is to begin at completion of the south tower installation as per Dr. Kirk Clawson, NOAA/INL.

Response to Comment:

USEPA concurs with this comment.

Finding (20):
Page 16

In October of 1990, a portable meteorological tower was borrowed from the National Oceanographic and Atmospheric Administration (NOAA), with these instruments being permanently mounted on the PORTS tower adjacent to the PORTS instrumentation in late 1991. The NOAA meteorological data format is not compatible with the existing PORTS data processing system, is not used for compliance monitoring, but is used as a means of verifying data from the PORTS instrument set. Also, a present meteorological system with new instruments and add six additional monitoring towers; the additional towers are intended to support activities at the site's Emergency Operations Center. This new meteorological system is expected to provide data necessary for NESHAP, Subpart H Compliance modelling.

Comment:

As noted earlier the new meteorological tower will have the upgraded equipment installed and be in compliance with EPA/600/4-90/003. The additional towers mentioned above are from a Site Survey Study performed by Dr. Will Pendergrass, NOAA, Oak Ridge; and are subject to funding which has not been allocated because of budgetary considerations at this time.

Response to Comment:

USEPA Concurs with this comment.

Inspection Under the National Emission Standards for
Emissions of Radionuclides Other Than Radon
From Department of Energy Facilities
40 CFR 61, Subpart H

I. FACILITY IDENTIFICATION

A. Facility Location

Portsmouth Gaseous Diffusion Plant
3930 U.S. Route 23 South
Piketon, Ohio 45661

B. Responsible Official

USDOE E.W. Gillespie, Site Manager
Phone: (614) 897-5010

USEC T. Michael Taimi, Environmental Assurance and Policies Manager
Phone: (301) 564-3409

II. DATE OF INSPECTION

July 22 - July 26, 1996

III. PARTICIPANTS

A. Facility

Melda Rafferty, USDOE/PORTS; Kristi Wiehle, USDOE/PORTS; Dean Roberts, LMES; Dick Snyder, LMES; Robert Blythe, LMUS; Mary Young, USEC; Tony Saraceno, LMUS; Larry Zonner, LMUS; William Gundlah, LMUS;Jason Patrick, LMUS; Wayne Spetnagel, LMUS; Carol

Van Meter, LMUS; James Litteral, LMUS, David Richter, LMUS; Charles Good, LMUS; James Williams, LMUS; Greg Fout, LMUS; Roger McDurmet, LMUS.

B. USEPA

Michael H. Murphy, USEPA Region 5; Eugene Jablonowski, USEPA Region 5; Charles Phillips, SC&A, Contractor for USEPA

C. State of Ohio

Steve Alspach, OEPA, SEDO; Dan Thompson, OEPA, CDO; Stacey Coburn, OEPA, CDO; William Lohner, OEPA, OFFO; Frank Talbot, ODH/BRP; Celeste Lipp, ODH/BRP.

IV. ACRONYMS AND ABBREVIATIONS USED IN THIS REPORT

ANSI	American National Standards Institute
APC	Air Pollution Control
BE	Building exhaust
BRP	Bureau of Radiation Protection
CDO	Central District Office
CFR	Code of Federal Regulations
cpm	Counts per minute
DAPC	Dayton Air Pollution Control or Division of Air Pollution Control
DMR	Discharge Monitoring Report
DQO	Data Quality Objective
EML	Environmental Measurements Laboratory
EMSL-LV	Environmental Monitoring Systems Laboratory at Las Vegas

FFCA	Federal Facility Compliance Agreement
g	Grams
Ge(Li)	Germanium Lithium detection probe
HASA	High Assay Sampling Area
KeV	Kilo electron volts (1000 electron volts)
LMES	Lockheed Martin Energy Systems (formerly MMES)
LMUS	Lockheed Martin Utility Services (formerly MMUS)
µm	Micrometer, Micron (0.000001 meter)
MDA	Minimum Detectable Activity
MDL	Minimum Detection Limit
MMES	Martin Marietta Energy Systems
MMUS	Martin Marietta Utility Systems
N/A	Not Applicable or Not Available
NAREL	National Air and Radiation Environmental Laboratory
NESHAP	National Emission Standard for Hazardous Air Pollutants
NOAA	National Oceanographic and Atmospheric Administration
ODH	Ohio Department of Health
OEPA	Ohio Environmental Protection Agency
OFFO	Office of Federal Facility Oversight
PAT	Proficiency Analysis Testing Program
PET	Proficiency Environmental Testing Program
PORTS	Portsmouth Gaseous Diffusion Plant

QA	Quality Assurance
QAPjP	Quality Assurance Project Plan
QC	Quality Control
SC&A	Sanford Cohen and Associates
SEDO	Southeast District Office
SOPs	Standard Operating Procedures
Tc-99	Technetium-99
TRU	Transuranic materials
U-235	Uranium-235
USDOE	United States Department of Energy
USEC	United States Enrichment Corporation
USEPA	United States Environmental Protection Agency
WP	Water Pollution Performance Evaluation Study

V. OBJECTIVE/SCOPE OF INSPECTION

The objective of this inspection is to provide a follow-up to the baseline evaluation by the USEPA for compliance with the radionuclide NESHAP, 40 CFR 61, Subpart H of March 16-19, 1993. The inspection is intended to ascertain whether the Portsmouth Gaseous Diffusion Plant is in compliance with the Rule. The Findings of this inspection will determine the necessity of negotiating a Federal Facility Compliance Agreement (FFCA). This inspection will cover similar areas and should be of the same depth as the baseline inspection.

The scope of the inspection is to 1) perform a walk-through survey to observe all of the locations that are, have been, or are currently suspected of being emission points on site to determine compliance with the monitoring requirements of the regulation, and 2) examine documents on dose modeling and compliance with other record keeping requirements of the rule.

VI. FACILITY DESCRIPTION

The following site description is taken from the Calendar Year 1995 annual report submitted to the USEPA on June 24, 1996.

The Portsmouth Gaseous Diffusion Plant (PORTS) is owned by the Department of Energy (DOE). PORTS was operated by DOE and managed by Martin Marietta Energy Systems, Inc., until July 1, 1993. In 1992 Congress passed legislation amending the Atomic Energy Act of 1954 to create the United States Enrichment Corporation (USEC), a government corporation similar to the Tennessee Valley Authority, to operate the uranium enrichment enterprise in the United States. The new corporation began operation on July 1, 1993. In accordance with the Act, USEC leased all production facilities at PORTS and its sister plant at Paducah, Kentucky, from DOE. DOE retained operational control of all waste storage and handling facilities as well as all sites undergoing environmental restoration.

The PORTS site is located in sparsely populated, rural Pike County, Ohio, on a 16.2-km² (6.3-mile²) site about 1.6 km (1 mile) east of the Scioto River Valley at an elevation of approximately 36.6 m (120 ft) above the Scioto River floodplain. The terrain surrounding the plant, except for the Scioto River floodplain, consists of marginal farmland and densely forested hills. The Scioto River floodplain is farmed extensively, particularly with grain crops.

Pike County has a generally moderate climate. Winters in Pike County are moderately cold, and summers are moderately warm and humid. The precipitation is usually well distributed with fall being the driest season. Prevailing winds at the site are out of the southwest to south. Average wind speeds are about 5 mph (8 km/h) although winds of up to 75 mph (120 km/h) have been recorded at the plantsite. Usually high winds are associated with thunderstorms that occur in spring and summer. Southern Ohio is within the midwestern tornado belt although no tornados have struck the plantsite to date.

Pike County has approximately 23,000 residents. Scattered rural development is typical; however, the county contains numerous small villages such as Piketon, Wakefield, and Jasper, which lie within a few kilometers of the plant. The county's *largest community, Waverly, is about 19 km (12 miles) north of the plantsite and has a population of approximately 5,100 residents. Additional population centers within 80 km (50 miles) of the plant are Portsmouth (population 25,500), Chillicothe (population 23,420), and Jackson (population 6,675). The total population of the area lying within an 80-km (50-mile) radius of the plant is approximately 600,000.*

USEC is responsible for the principal site process and support operations. The principal site process is the separation of uranium isotopes through gaseous diffusion. Support operations include the feed and withdrawal of material from the primary process, treatment of water for both potable and cooling purposes, steam generation for heating purposes, decontamination of equipment removed from the process for maintenance or replacement, recovery of uranium from various waste materials, and treatment of industrial wastes generated onsite. DOE is responsible for the decontamination activities in the X-326 building, X-326 "L-Cage" and its glovebox, X-345 high assay sampling area (HASA), X-744G glovebox and site remediation activities. The emissions from the DOE sources listed in this report represent 13% of the air emissions from the USEC Source one (X-326 Top Purge, Side Purge and E-jet vents), 13% of the emissions from the Seal Exhaust (SE) 6 (which is part of USEC Source two), and all of the emissions from DOE sources one (X-326 SE 5 Vent) and two (X-345 HASA).

VII. INSPECTION FINDINGS

An Inspection of the Portsmouth Gaseous Diffusion Plant (PORTS) was conducted on July 22 through July 26, 1996. The Inspection team was comprised of staff from USEPA, SC&A under contract to USEPA, OEPA, and ODH. As most of the production facilities are currently under the operation of USEC and LMUS, the USDOE and LMES played only a minor role in this inspection. A general overview and observations are included in the General Findings heading, with the specific issues to be addressed listed under Specific Findings along with recommendations to address these issues.

GENERAL FINDINGS

The inspection found that the staff of the Portsmouth Gaseous Diffusion Plant were cooperative and receptive to all requests for information for the evaluation of the facility compliance status. Generally, the program appears to be well run and documented, with the personnel being competent and sincere in their desire to meet the requirements of the radionuclide NESHAPs regulations.

There were, however, some areas that need some additional improvements or better documentation to better meet the needs of the regulation. Additionally, there were two areas in the sampling systems that need to be addressed to bring them into conformity with the other sampling systems in the facility.

1) Since the baseline inspection in 1993, there has been considerable improvement is the sampling systems at PORTS. 2) Personnel were competent and were observed to have a good understanding of the principles that were required for successful performance of their duties. They were also very open and responsive to inquiries during the inspection. 3) The Quality Assurance Plan was relatively comprehensive, though it did lack sufficient detail in some areas. The laboratory staff had a good knowledge of the procedures and adhered to the SOPs. 4) Laboratory instrument calibrations appeared to have been performed adequately and in a timely manner. The standard preparations were well documented and traceable. Chemical standards were appropriately labeled and dated.

During the inspection verification of the HASA facility in the X-345 building was conducted. The HASA equipment has been locked out and is in the process of being decontaminated. Photographic documentation of this is to be provided by USDOE and LMES. This facility is not expected to be operational at any time in the future.

SPECIFIC FINDINGS

SAMPLING SYSTEMS:

1) On the X-344 Gulper System, the flanges were cracked, allowing the possibility of an unmonitored release of radionuclides. The fastenings were inappropriate for the area. Masking tape and threaded rod with nuts on each end holding them on the system need to be re-evaluated. It would be more usual to find the nuts locked in place with a second nut or a

sealing material. This should also preclude the necessity of any type of tape or outside adhesive sealing on the flanges. It would also be recommended that there be a regular, documented checking of the flange conditions at this location and any other location where similar situations may arise.

2) In the X-326 building, the Top, Side and E-Jet samplers need to be reconfigured to conform with the other sampling systems. A portion of the current system has lines that are excessive in length as well as an excessive number of bends. This could be easily remedied by the removal of this portion of the system and consolidating the sampling system into individual units, as the other systems have in place currently.

DOCUMENTATION:

1) During the investigation, the use of an unmodified, in-house developed computer spreadsheet program for calculating Tc-99 concentrations using liquid scintillation counting data, became an issue. Upon interviews with laboratory personnel, it came to light that a change in the method used to calculate Tc-99 concentrations from raw data generated by liquid scintillation counters had occurred. Of the three computers used to calculate the Tc-99 values, at least one computer system was not updated. It is unclear the exact number of incorrectly calculated values for Tc-99 that are currently assumed to be correct. The PORTS laboratory needs to determine and report to the Region 5 office the numbers of incorrectly calculated Tc-99 values as soon as is practical. Additionally, a table needs to be prepared listing the incorrect values along with the correct values. The Region 5 office needs to be apprised of the potential impact(s) of the issue.

2) The spreadsheet calculations for the Tc-99 did not include MDA values. The actual MDAs are likely below the reporting limit; however, there is no way to verify this if the MDAs are not calculated. To remedy this situation, the MDAs need to be included in the calculations for the Tc-99 data.

3) It was noted that in the Data Package Review Checklist for batch #9607099936 (U-235) was not signed or apparently reviewed by the supervisor. This signature is required by the laboratory Quality Assurance Plan. It was further noted that the Data Package Review Checklist for batch 96070448 (U-235) was left totally blank, aside from the batch number. This data

package was apparently not reviewed, though the package contained all of the information that is required. From these two separate examples, it appears that the procedures for verification of completeness needs to be addressed. It would also be advisable to do a more thorough audit to ascertain how frequently this issue has occurred as well as its potential impact on the data provided.

4) Uranium and Technetium release data are hand calculated from the data reported in the AnaLis system and from data recorded from the vent samplers. While these hand calculations are verified by a second individual, there would be less probability of an error if they were performed by a validated computer software (i.e. spreadsheet).

5) There is no indication on the vent sampler log sheets of the trap numbers which are put in place. Some of the entries on these log sheets were marked through, voided, without being initialed and dated. The QA/QC program currenly in place requires changes to be initialed and dated.

<u>OTHER OBSERVATIONS/ISSUES</u>

1) Gloves were disposed of in a waste receptacle that had a sign stating that it was for sanitary waste only. Procedures for disposal of specific items should be specified more clearly.

2) SOPs for software validation need to be generated for any on site software that may be used for compliance purposes.

3) Documentation for the abandoned sampling ports on the sampling systems in the X333 building needs to be provided. These additional ports could potentially cause additional turbulence that could affect the representativeness of the sample collected.

4) A log for the sample shaker to provide data on the actual time of mixing for the alumina is suggested. This would provide documentation on the mixing procedure(s) and the time of mixing prior to further sample preparation.

5) While the calibration data was available for the ambient monitors in documentation kept at the facility, it is recommended that calibration stickers be placed on the instruments also. Additionally, any line rinsate analysis for the

ambient monitors needs to be included in the data analyzed for diffuse emissions.

6) An annual composite analysis of the secondary traps for TRU materials is recommended. This would provide additional data about potential radionuclide emissions from past reprocessing activities.

Comments and Response to Comments

Below are the comments that were made along with the response to the comment made. Additionally, it is noted the person and agency that the person represents is listed with the comments made.

Steve Alspach, SEDO, Ohio EPA

1) Sampling Systems, #1, reference is made to a nut and bolt connection when in fact it was a piece of threaded stock with two nuts (one on each end). A bolt commonly has a head on one end and is threaded on the other end for a single nut to make the connection, whereas threaded stock requires a nut on each end to make the necessary (safe) connection. I think the word 'bolt' just doesn't stress the seriousness of this situation. All-well, its not a biggie - just something to think about.

Response: *Point well taken. The report has been revised to more accurately reflect the type of connection fixture and the potential for problems represented by this situation.*

2) Documentation #2, MDA is not in the abbreviation list.

Response: *The list of abbreviations and acronyms has been revised to include this acronym and meaning.*

3) Other Issues, Regarding the ambient sampling network, it was brought up during the inspection that it might be better to have the collection filters more exposed to the atmosphere for the sample collection rather than pulling the air sample thru the small protruding elbow on the sampler and then down thru the small diameter tubing to the filter. I know, you'd think this issue would have been beat-to-death at the time when the network was in it's design phases, but I've been unable to find any information to that effect or anyone who has much experience with rad monitors. That should change when (if ever) the agency begins to co-monitor the site.

Response: *This is a good point to bring to our attention. It is not clear whether these stations are being used to assist in demonstrating compliance with the NESHAPs Standard. If this is the case, then the systems must meet all of the USEPA criteria for air monitoring for the radionuclides.*

Frank Talbot, ODH/BRP

4) The only finding I have, beyond those shared with you in Chillicothe, is the lack of accountability and traceability of the sample prep as it moves from lab to lab.

Response: *This is an interesting point to be brought to our attention. As the transfer of the sample during sample preparation is referenced in the current SOP manual, I am uncertain whether this can be considered untraceable or unaccounted for. I will look into this issue further and provide a more definitive answer as soon as I can determine the adequacy of the current SOP in this regard.*

Celeste Lipp, ODH/BRP

5) Section V, Objective ...is still meeting the finding of the previous Inspection... I think it should read that you wanted to see whether the facility has corrected the findings identified in the previous inspection; they are not supposed to keep on failing. Also, findings and inspection shouldn't be capitalized.

Response: *This comment has been incorporated as appropriate into the revision of the report.*

6) Section VI, Facility Description Paragraph 1: ...(USEC. A corporation... The sentence should read ...(USEC, a corporation... If you split this one long sentence into two shorter ones, you would have greater clarity.

Response: *As this is a quoted description, the revision was corrected to the quoted form.*

7) Section VI Paragraph 4: ...Pike County has approximately 23,000 resident. ... residents.

Response: *This correction has been made.*

8) General Findings Paragraph 2, second sentence ... there... not ...There...

Response: *This correction has been incorporated.*

9) General Findings 2) principles, not principal.

Response: *This correction has been incorporated.*

10) Documentation 1) I suggest that you reword the statement that

PORTS "should" determine and report the corrected values to you. "Should" sounds optional; I think you require this information as part of their response to the inspection. 3) ascertain, not acertain. 5) ..."without being initialed and dated." I suggest that you refer the requirement for initialing and dating changes; I couldn't find it in the NESHAPs reg itself, but suspect it's either in the SOP or a quality document.

Response: *These points are well taken and the report is being revised to reflect the appropriate changes.*

11) Other Observations 1) receptacle, not recepticle; 2) need, not needs; 4) ...at to the mixing...; This sentence is very unclear especially at this point.; 5) ...would be... should be changed to ...is...; 6) ...would be... should be changed to ...is... .

Response: *These points are well taken and the report is being revised to reflect the appropriate changes.*

Timothy Thurlow, USEPA/ORC

12) The report states that "the Findings of this Inspection will determine the necessity of negotiating a Federal Facility Compliance Agreement (FFCA)." Do you mean an FFCA under CERCLA 120, or some other kind of agreement? I've never dealt with a case before in which an inspection triggered a CERCLA 120 agreement, so I'm curious what was meant here.

Response: *The FFCA indicated is under the Clean Air Act provisions as it relates to one Federal agency's inability to fine another Federal agency, and not a CERCLA 120 type of agreement.*

13) The report provides an index to abbreviations. I found one - "MDA" on page 9 - that is not included in the index, and probably should be.

Response: *The abbreviation had been added to the listing.*

T. Michael Taimi, USEC/HQ
Jason Patrick, PORTS/LMUS

14) Section III. A. Facility - The spelling of McDurmet should be changed to McDermott. You might put the list of names in alphabetical order

to avoid any hard feelings.

Response: *Your points are well taken and have been appropriately incorporated in the revision of the report.*

15) Section IV. Acronyms and Abbreviations Used in This Report - Many of the Acronyms need a tab after them or a tab deleted. Delete the j form the QAPjP acronym.

Response: *The point regarding the appropriate spacing of the terms has been addressed. QAPP is a Quality Assurance <u>Program</u> Plan, while a QAPjP is a Quality Assurance <u>Project</u> Plan.*

16) Section VI. Facility Description, paragraph 6 - Delete the last sentence which makes reference to the percentage of emissions attributable to DOE.

Response: *Point is well taken and this deletion has taken place in the revision.*

17) Section VII. General Findings, 1) Change improvement is to improvement in.

Response: *The point is well taken and the revision is incorporated into the revised report.*

18) Section VII. General Findings, 4) fourth sentence - The sentence should read: During the inspection verification of the X-345 HASA facility, it was observed that the system is locked out and is in the process of being decontaminated.

Response: *The point is well taken and the appropriate changes have been incorporated in the revised report.*

19) Section VII. Specific Findings, 1) last sentence - I would like this statement to give us the leeway to avoid checking the flanges since we changed the flange assemblage.

Response: *To better clarify the intention of this observation, it is recommended that the flange assembly be checked on a regular basis, (i.e. when the traps in this area are undergoing normal maintenance, the flange assembly should also have a visual inspection conducted for potential problems).*

20) Section VII. Documentation, 1) sixth sentence - delete an a (from taable).

Response: *The point is well taken and the appropriate change has been made to the revised report.*

21) Section VII. Other Observations/Issues, 1) entirety - delete entire. I was not aware of a glove being disposed of in a sanitary waste receptacle. If the glove had been brought to my attention at the time I might have been able to address the concern. Procedures and policies for the disposal of various types of waste do exist. The disposal of a glove in a sanitary waste container does not present a problem unless the glove was contaminated. Disposal of an unused or defective glove which is not contaminated should not present a problem. I don't feel that this issue should be addressed in this inspection.

Response: *As there appears to be adequate guidance on when and where materials of various types may be disposed, and these policies and procedures are already in place, this point will be deleted from the report at this time.*

22) Section VII. Other Observations/Issues, 4) second sentence change at to as.

Response: *This point is well taken and the appropriate change has been incorporated into the revised report.*